

Variation in ionic radius between and within elements

The plot below shows how radius of ions varies with charge. A simple and intuitively satisfying summary would be "put more electrons on an atom, and it gets larger; take them off and it gets smaller". Because electrons carry negative charge, that summary leads to a similarly simple statement that "the greater the charge, the smaller the ion".

The plot compares data across elements (the black curves) and variation within elements (the colored curves, with a different curve for each element). For each black curve, the number of protons increases, increasing the

attraction of a fixed number of electrons (the number in the nearest noble gas). For each colored curve, the number of electrons decreases around a nucleus with a fixed number of protons defining that element.

Ionic radius is significant mineralogically because the size of an ion is critical in establishing whether that ion fits into a particular site in a possible mineral structure. Ionic potential, or charge divided by radius (shown here with gray lines), is significant geochemically because much geochemical behavior depends on ionic potential.

